

Fig.1

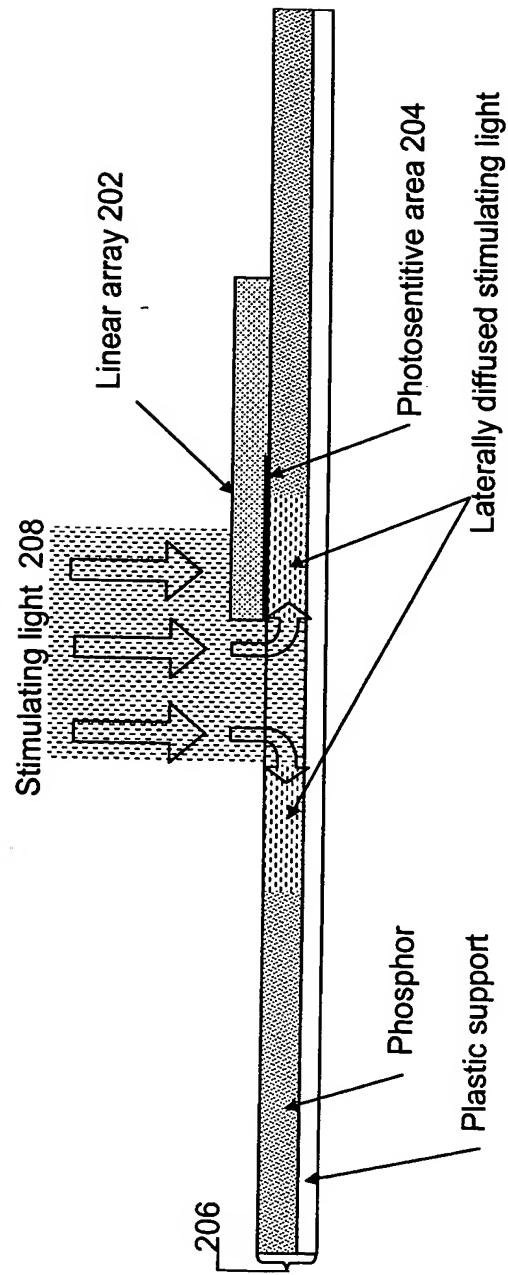


Fig.2

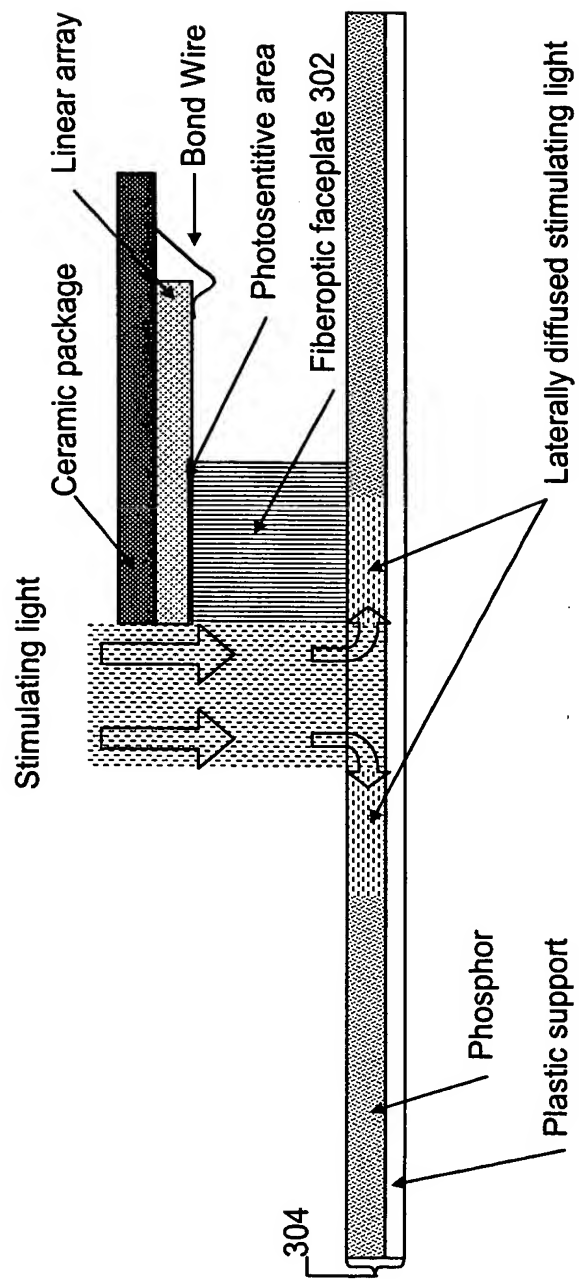


Fig.3

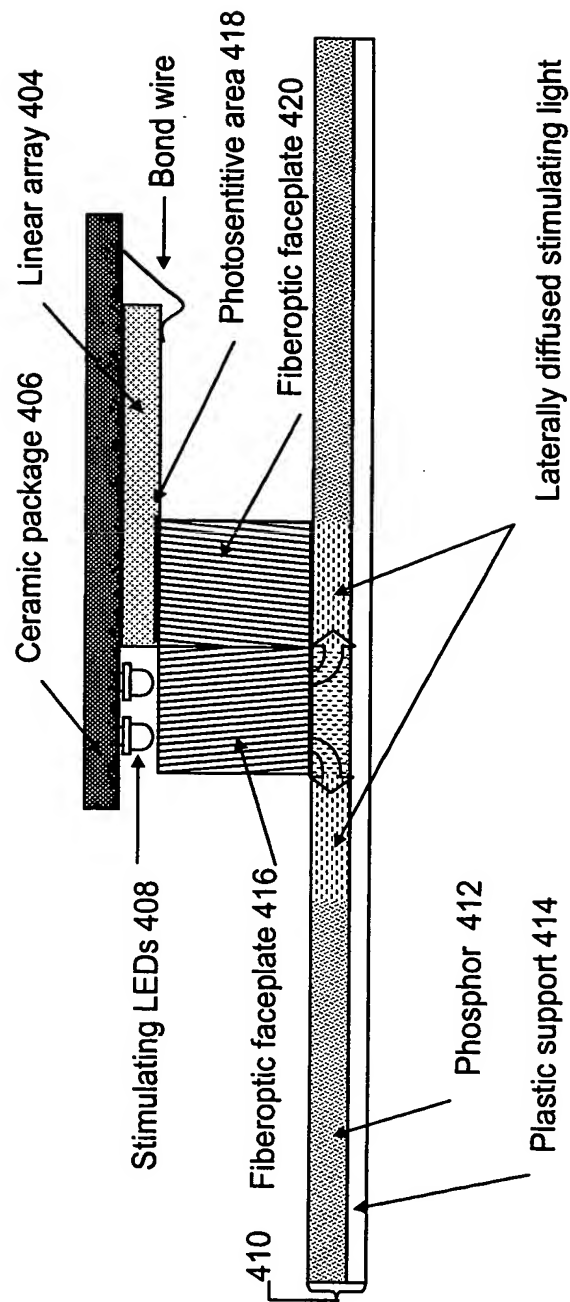


Fig.4

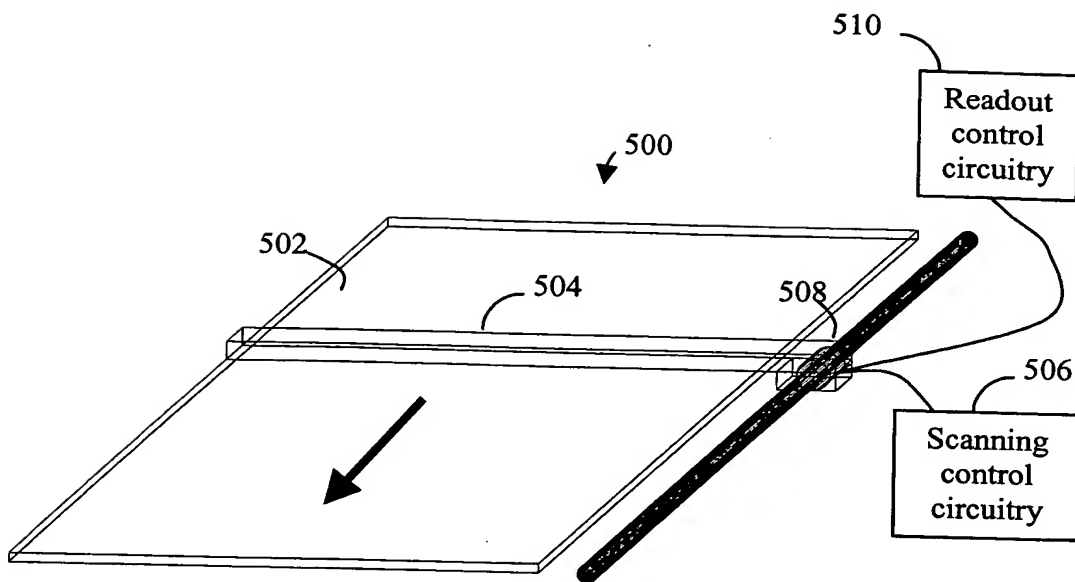


Fig.5

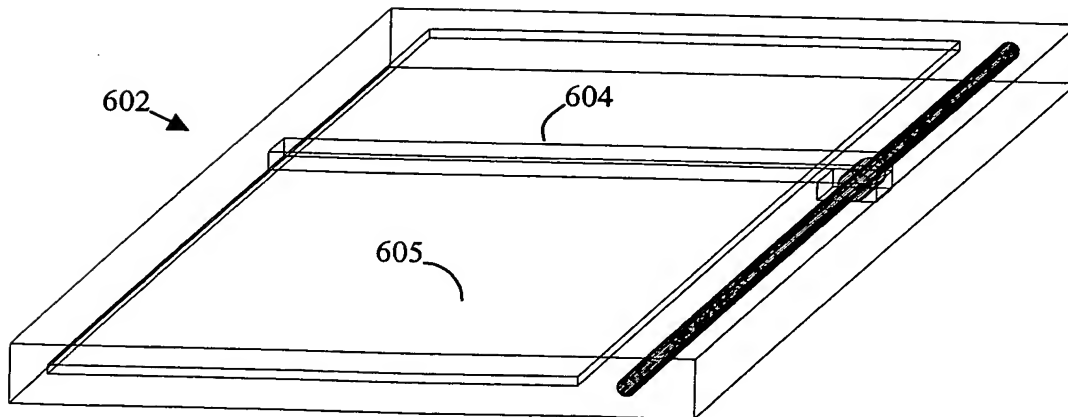


Fig.6

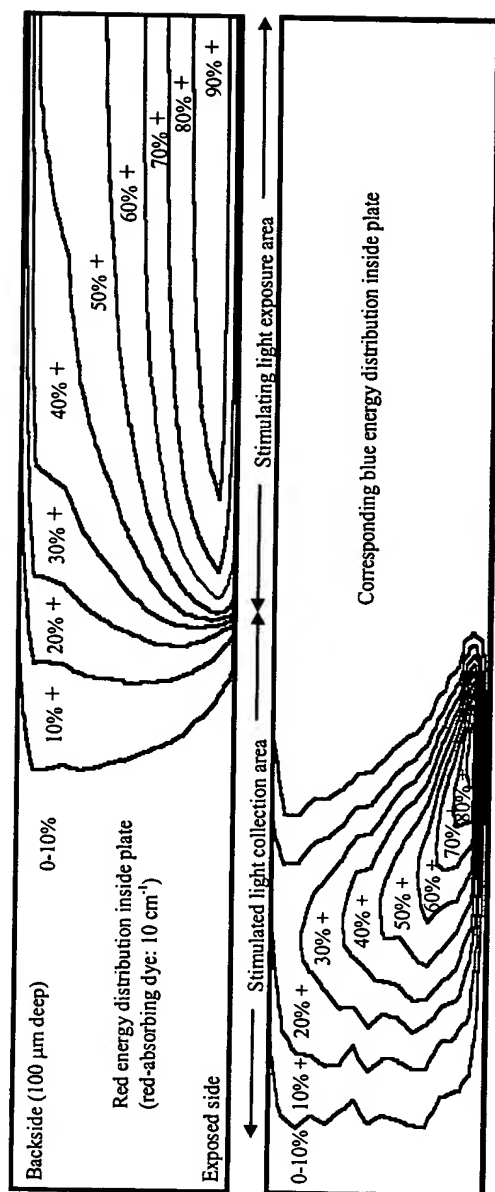


Fig. 7a

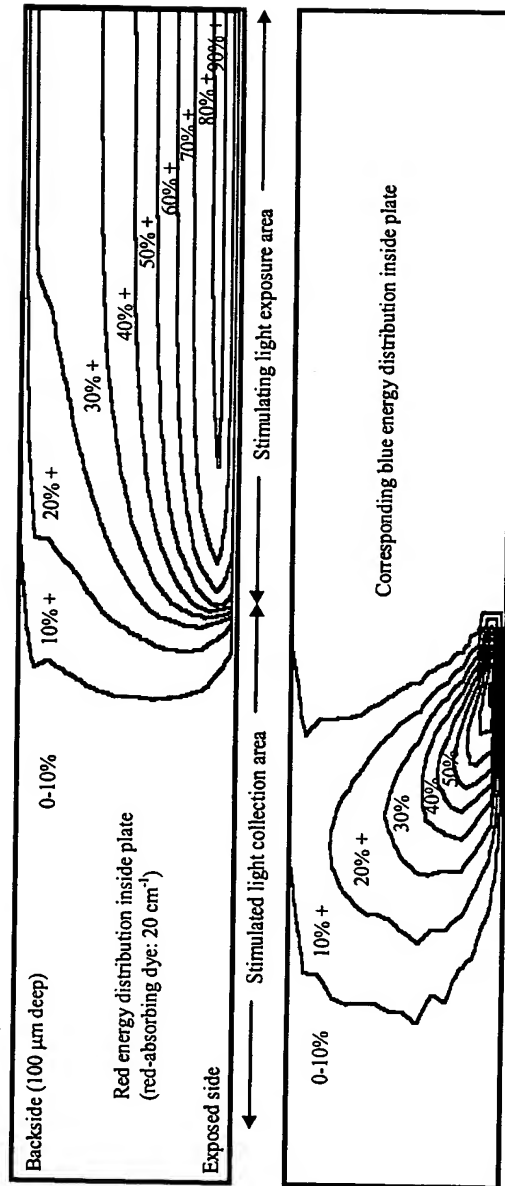


Fig. 7b

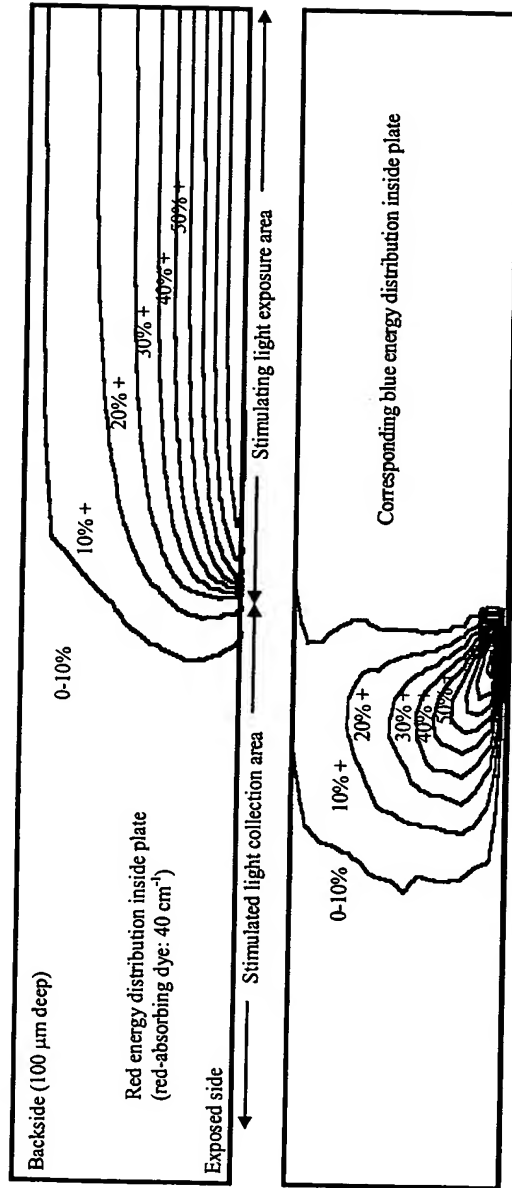


Fig. 7c

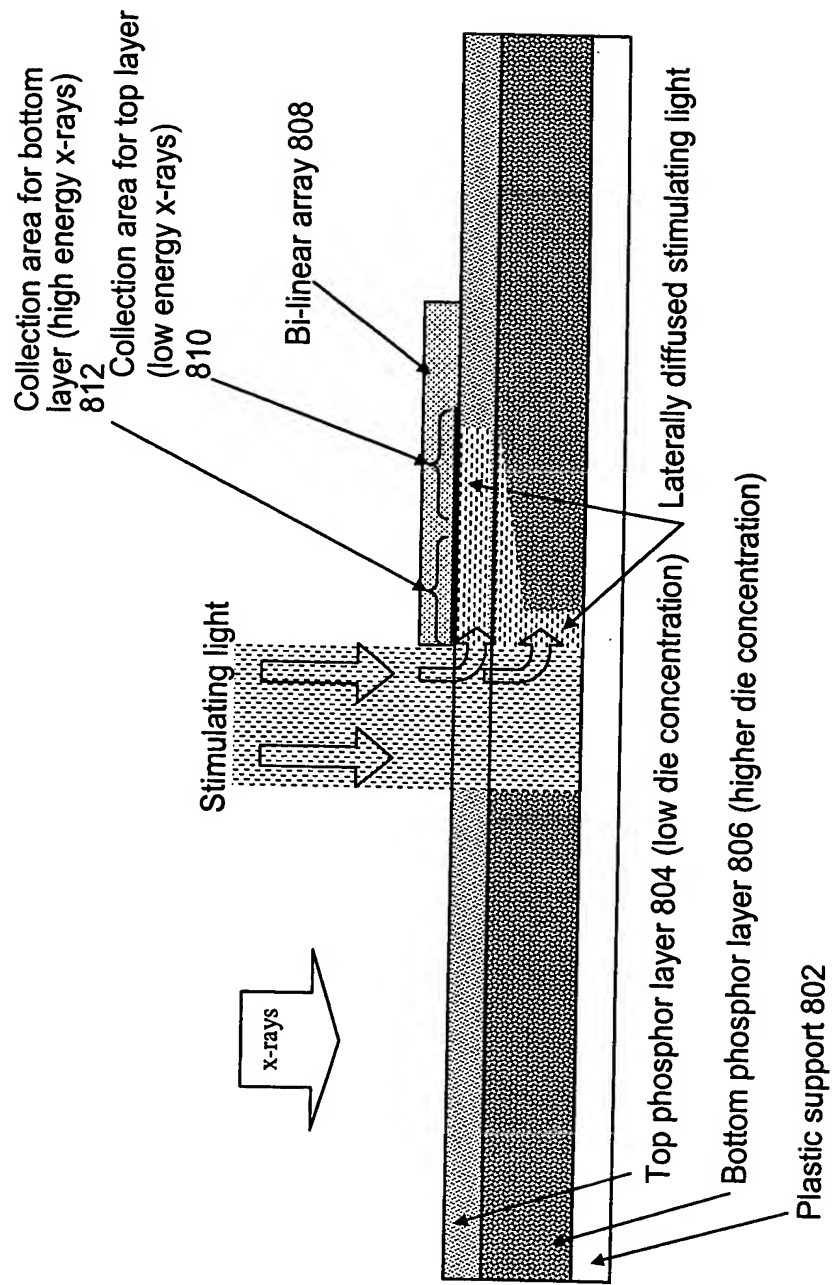


Fig. 8

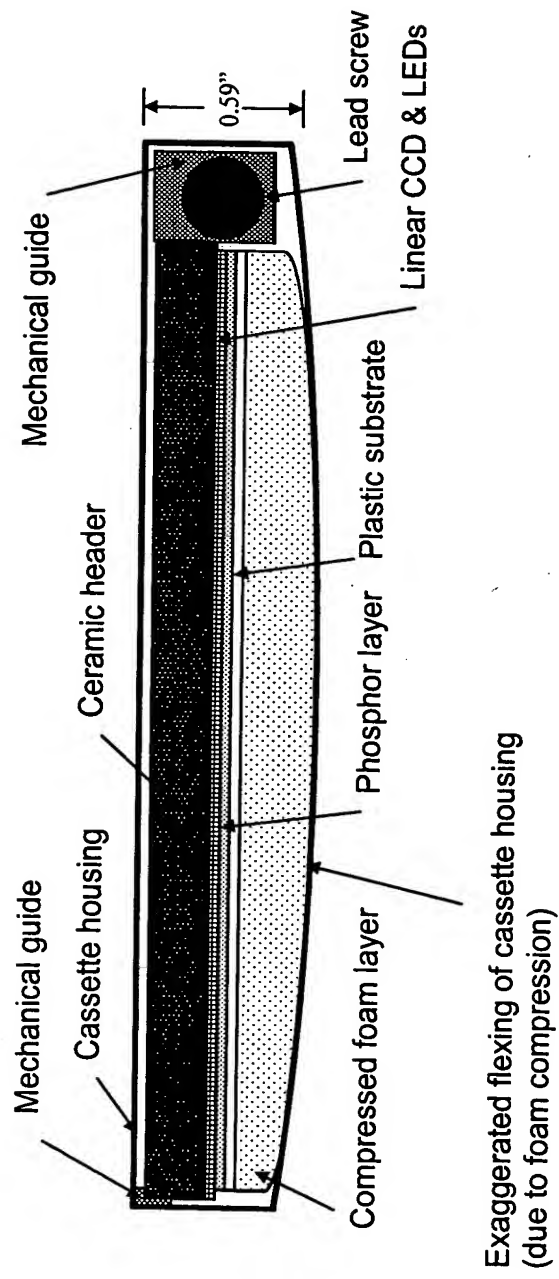


Fig. 9

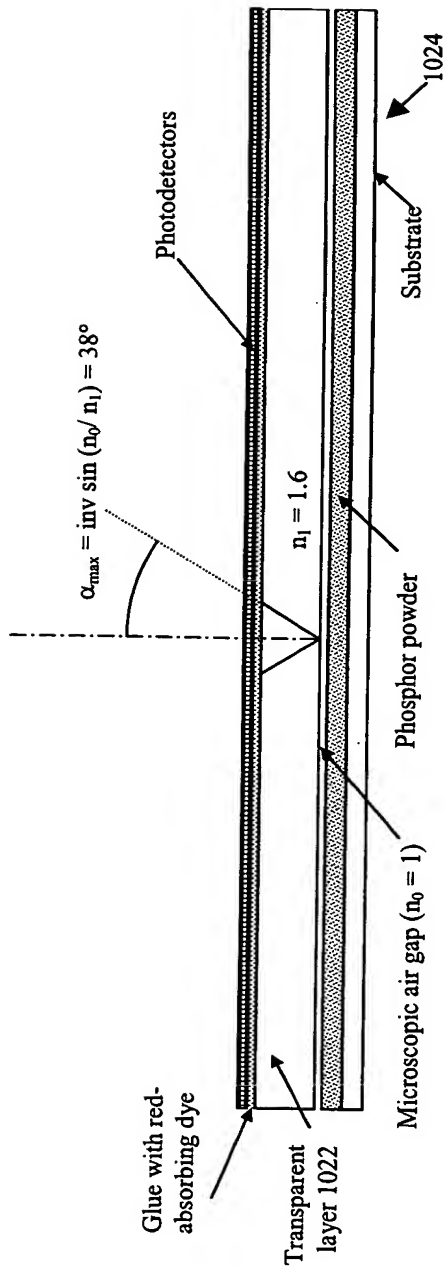


Fig.10 A

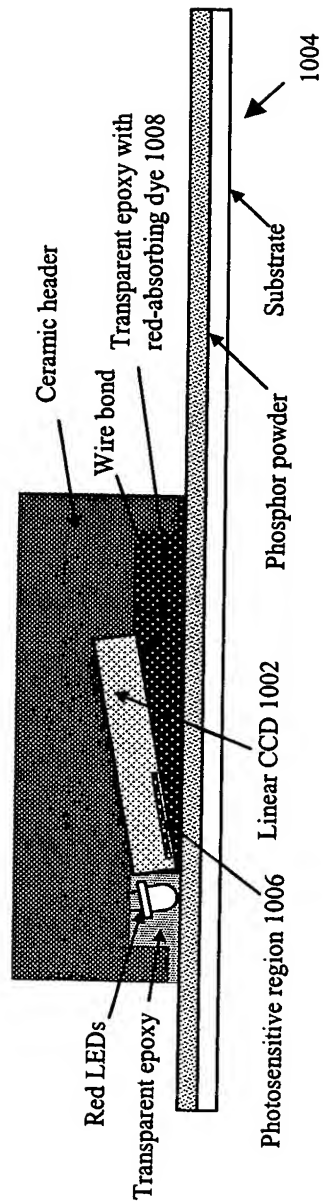


Fig.10 B

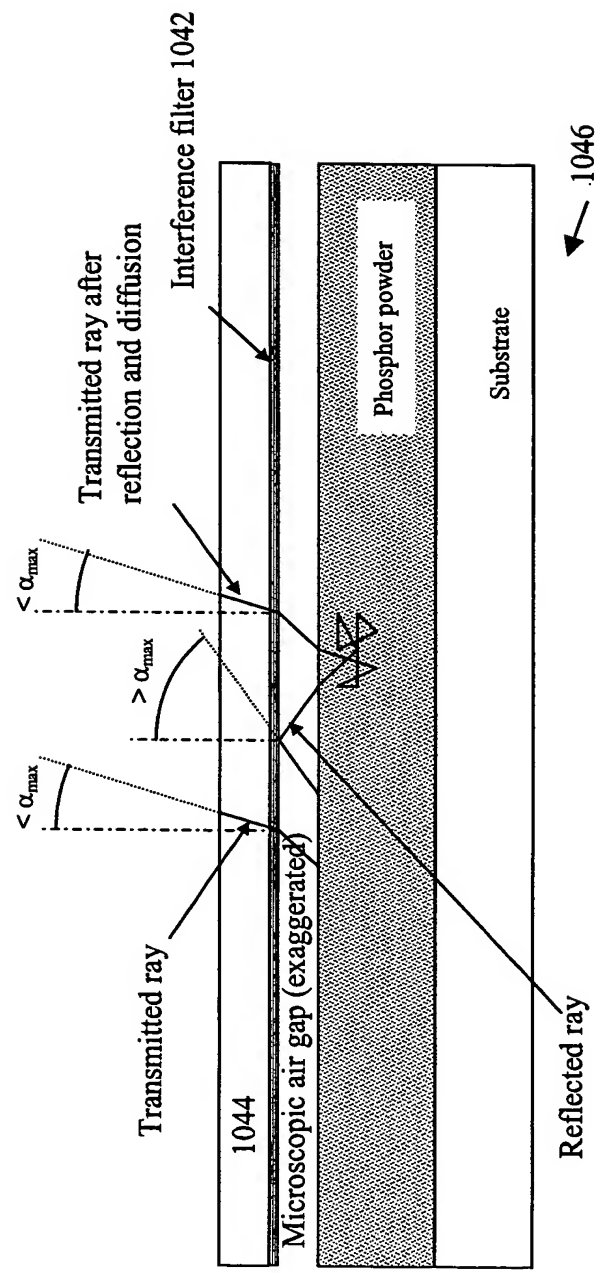


Fig.10 C

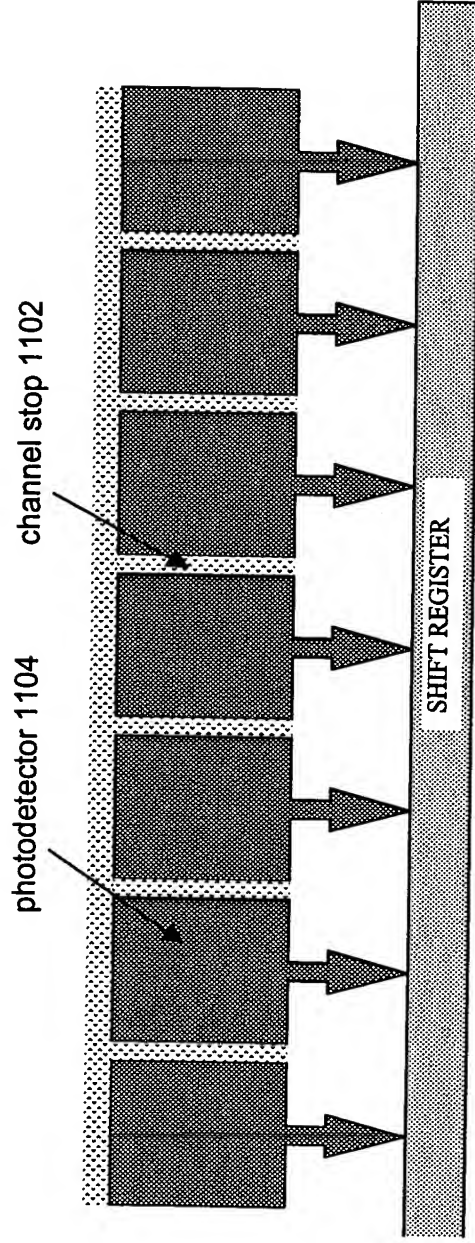


Fig. 11A
Prior art

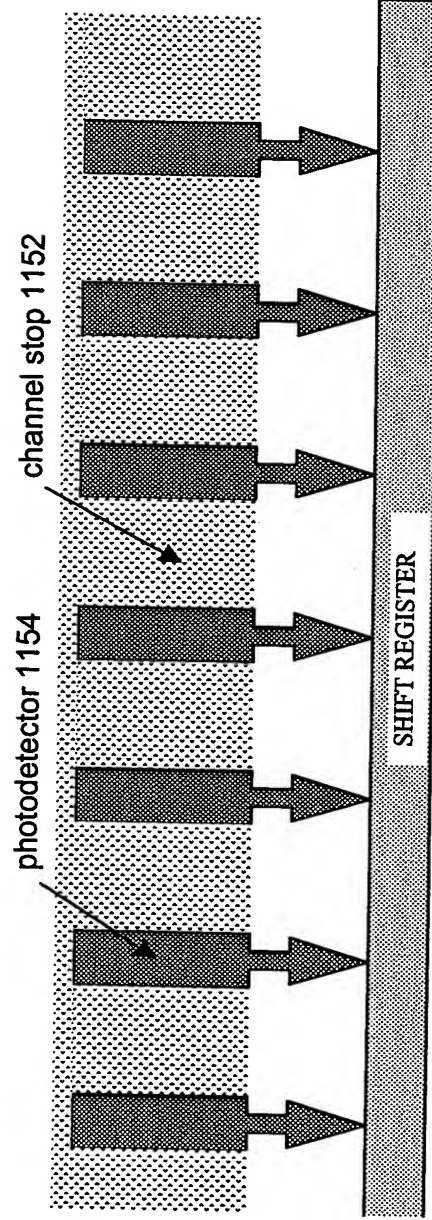


Fig. 11B
design

FIG. 12A Pixel response with narrow channel stops

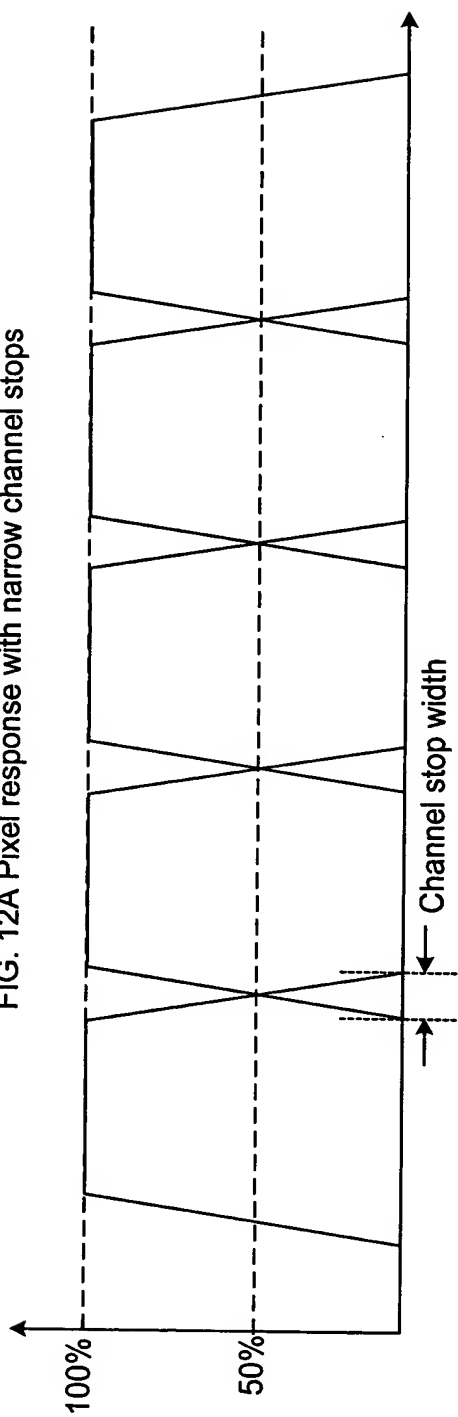


FIG. 12B Pixel response with wide channel stops

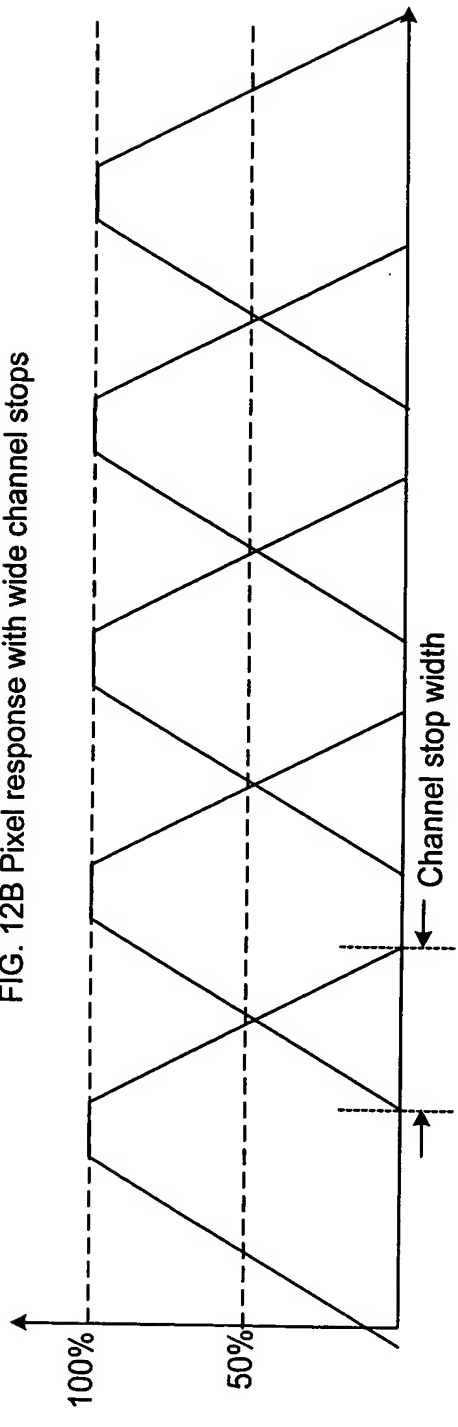


FIG. 12C Pixel response with 2x binning

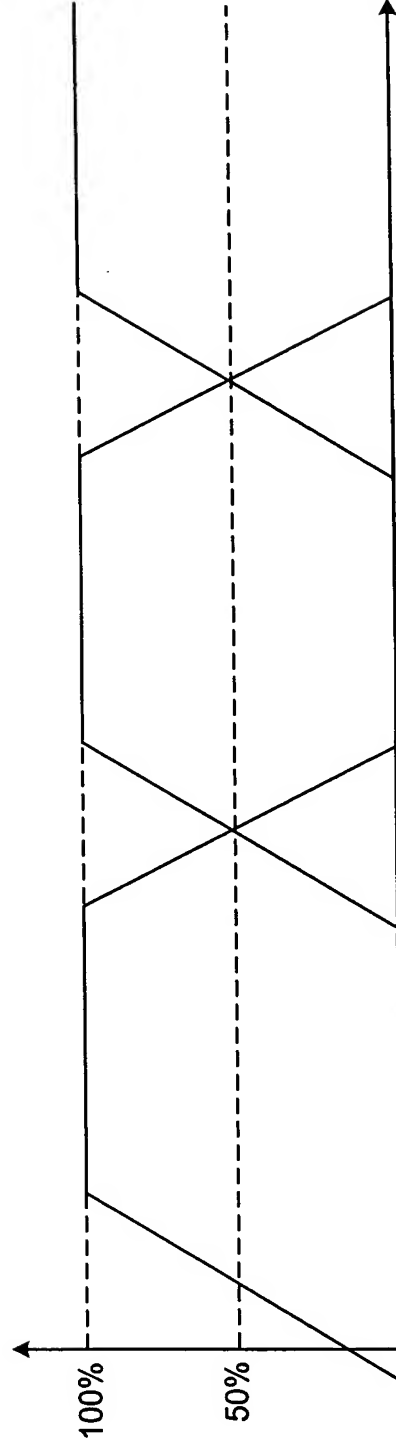
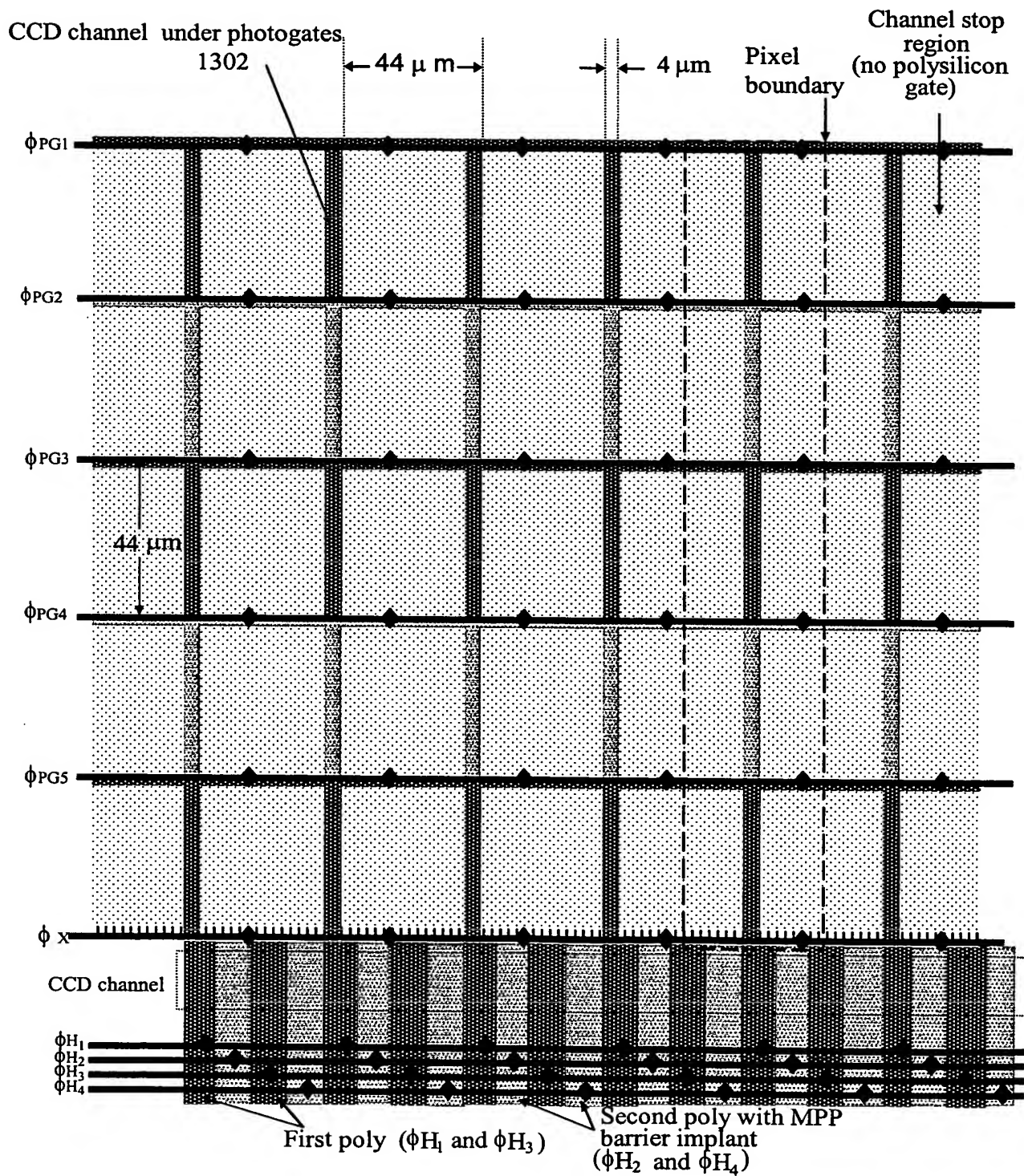
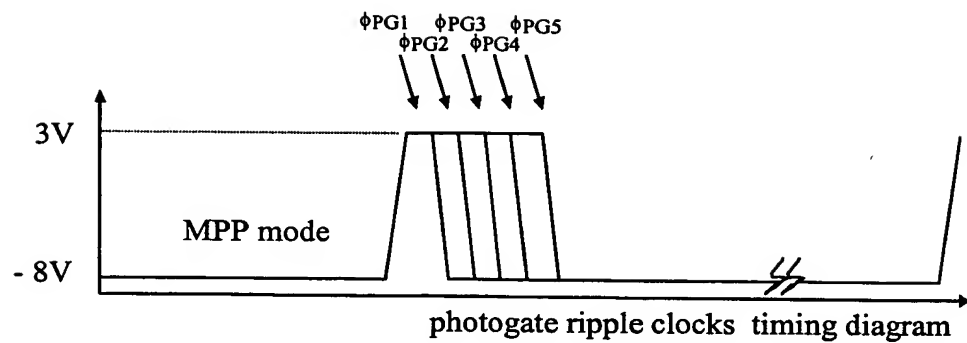


FIG. 13



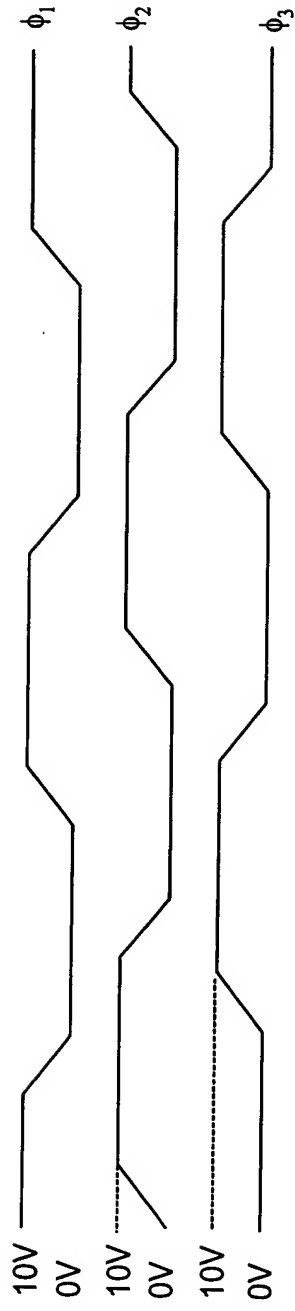


FIG. 14A Non-MPP continuous clocking of a 3-phase linear CCD

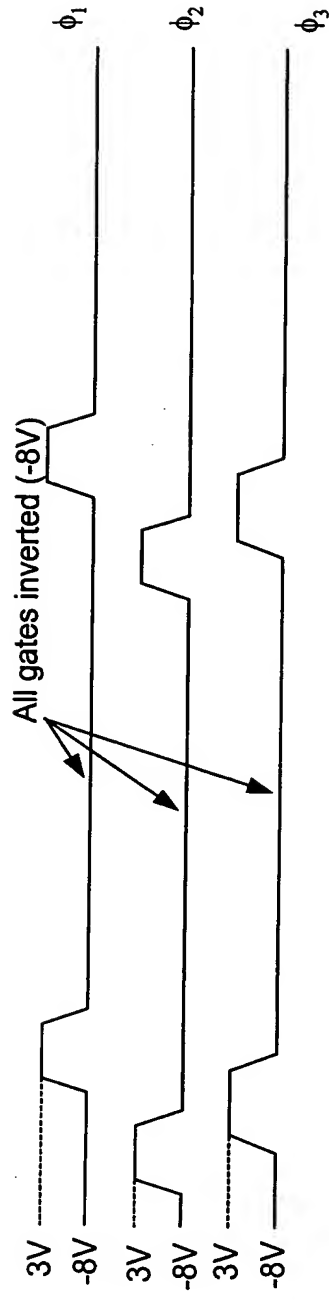


FIG. 14B MMP burst clocking of a 3-phase linear CCD

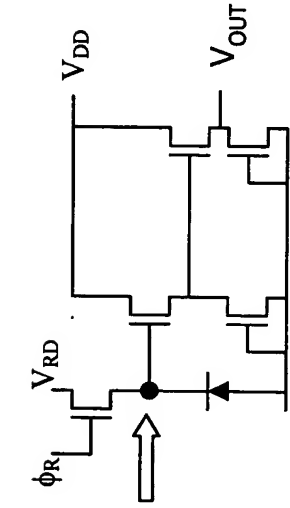


Fig. 15A dual-stage amplifier for linear CCD
(prior art)

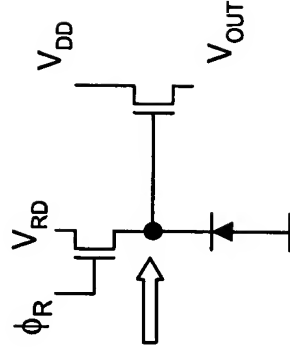


Fig. 15B single-stage amplifier for linear CCD

Fig. 16

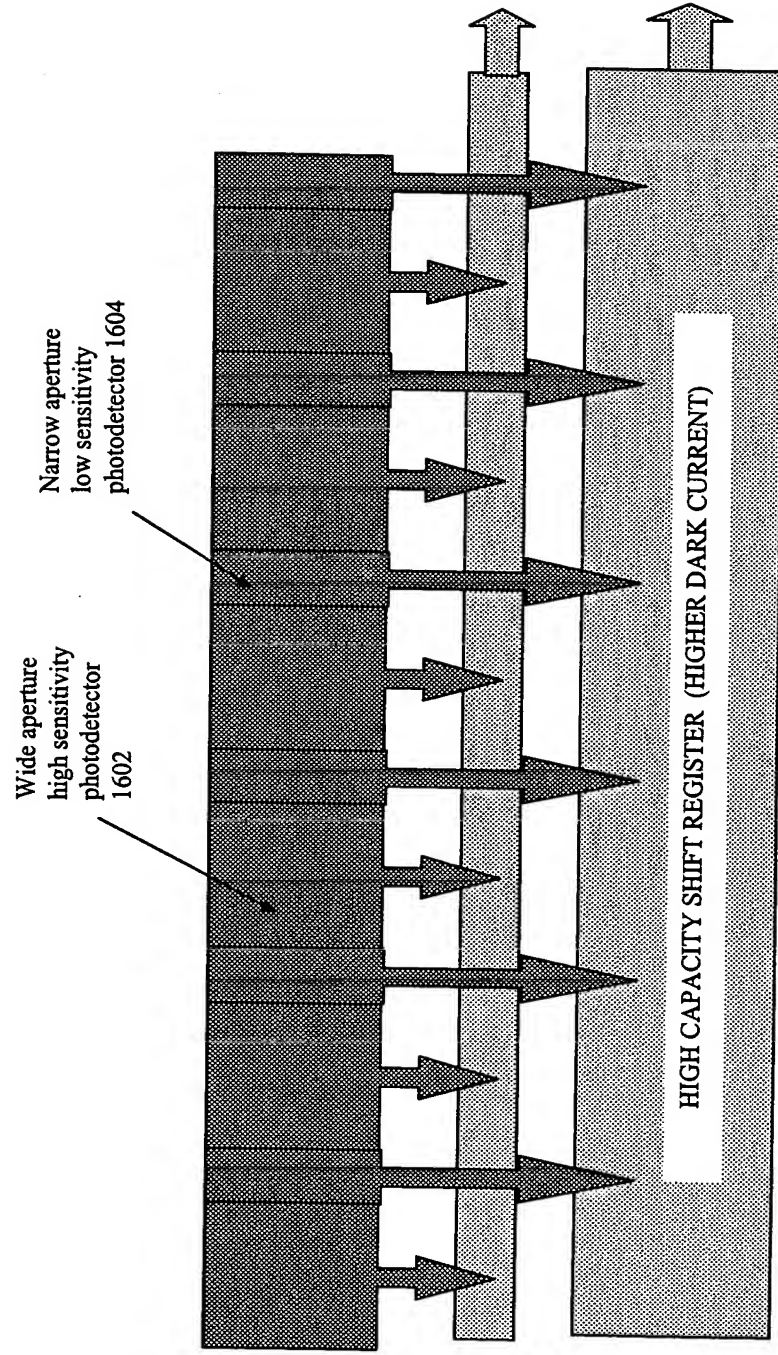


Fig. 17

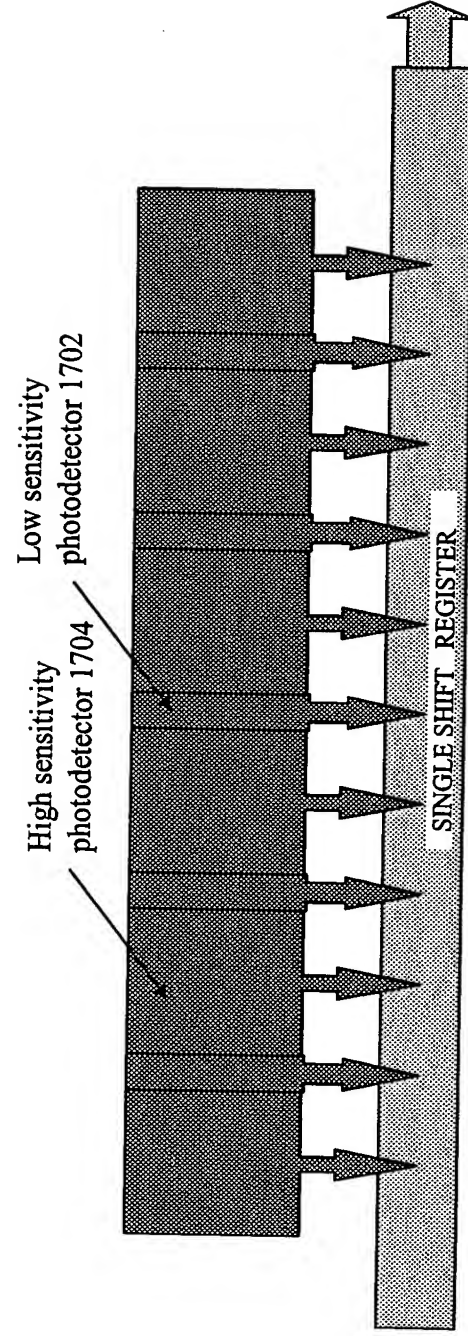


Fig. 18

Linear CCD specifications for storage-phosphor image plate reading

CCD architecture	Linescan (photosites & single register)
Photosite dimension	220 μm high x 44 μm wide (44 μm pitch)
Photosite design	5 photogates/pixel (44 μm high x 4 μm wide)
Shift register cell dimension	60 μm x 44 μm on a 44 μm pitch
Shift register design	2poly/2 ϕ or 4 ϕ switchable (with center split)
Shift register operation	Uni or bidirectional 2 ϕ or 4 ϕ (MPP mode)
Pixel count	2048 pixels
Die size	90.1 mm x 2.25 mm
Total dark current	< 20 pA/cm ² MPP mode at 25°C
Shift register dark current (MPP mode)	25e ⁻ /cell for 2ms integration at 40°C
Photogate charge transfer inefficiency (lag)	< 50e ⁻ at 1000 e ⁻ signal level
Well Capacity	10 ⁶ e ⁻
Amplifier readout noise	5 e ⁻ at 250 kHz (single-stage amplifier)
Output configuration	1 or 2 outputs in split mode (opposite ends)
Effective Quantum Efficiency (uncoated)	> 50% at 400nm (63% QE x 80% FF)
Effective Quantum Efficiency (AR coated)	> 75% at 400nm (94% QE x 80% FF)
Open photogate fill factor (no poly coverage)	> 80%
Maximum readout speed	500 kHz
Binning	4x
Charge Transfer Efficiency	0.99999
Buttability	3 side buttable (< 22 μm dead space)

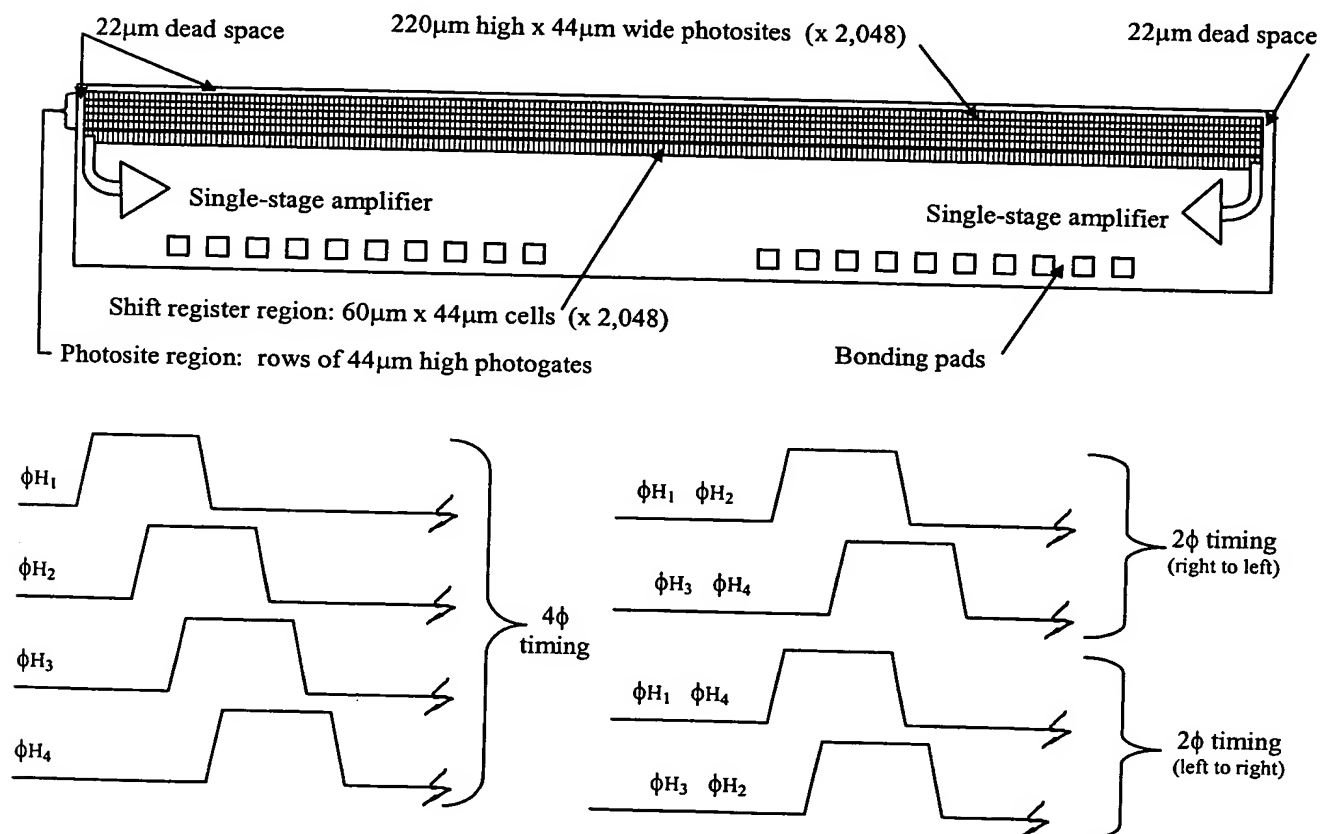
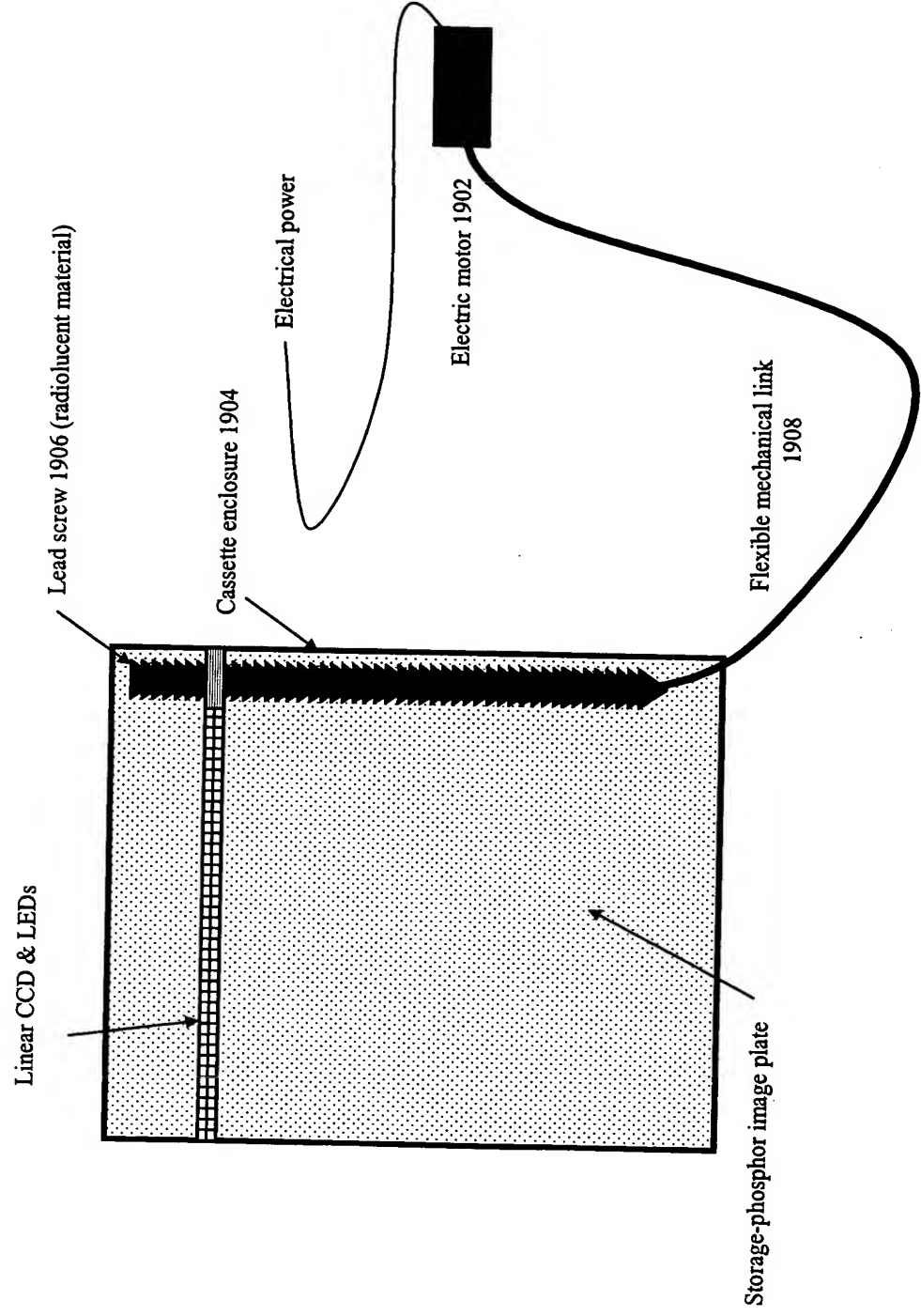
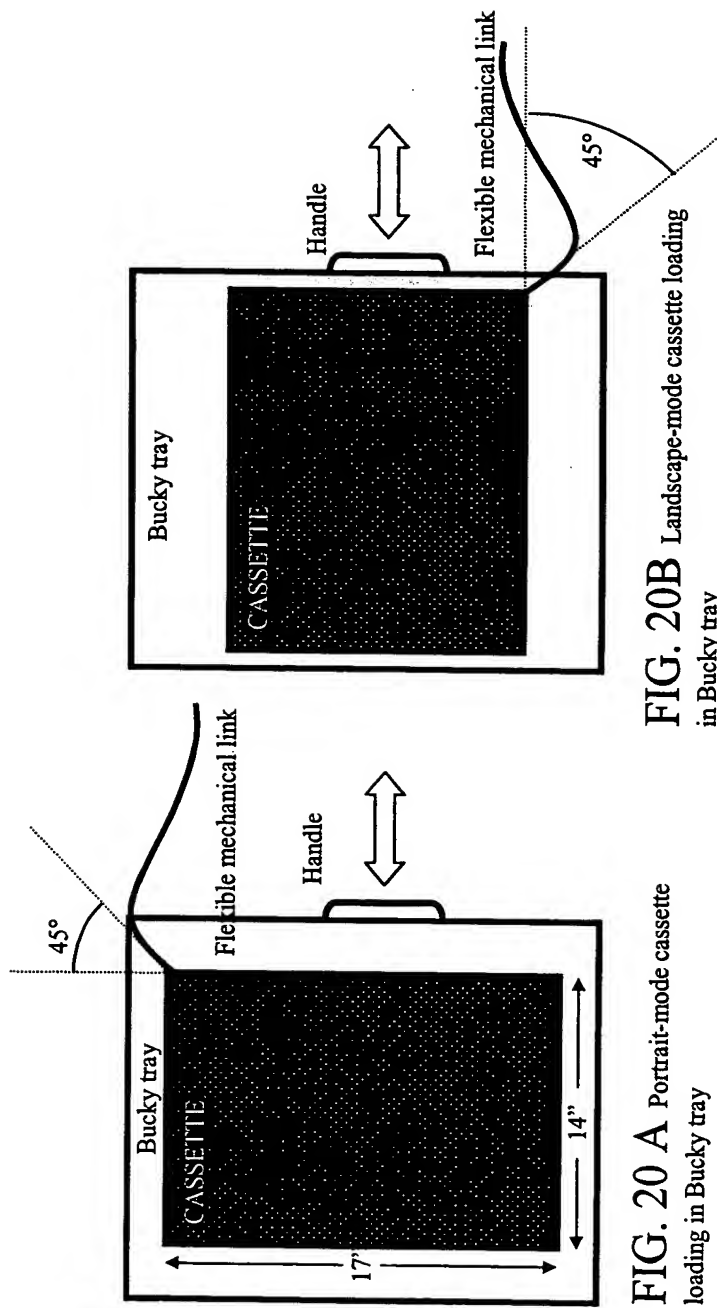


Fig. 19





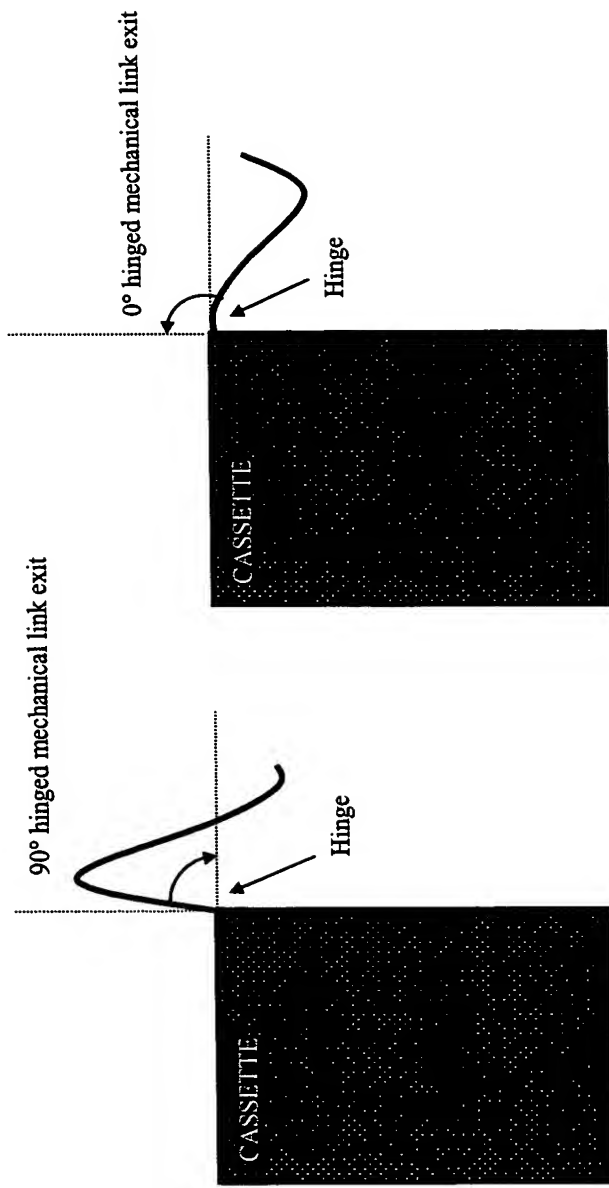


Fig. 21A

FIG. 21B

Fig. 22

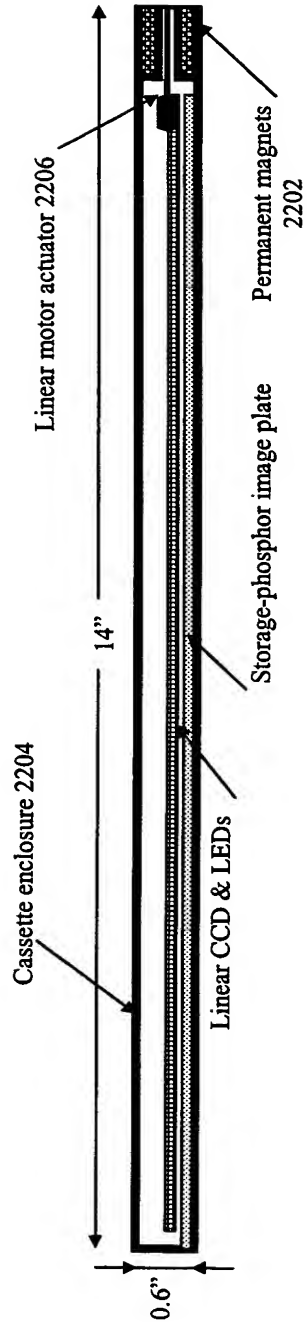


Fig. 23

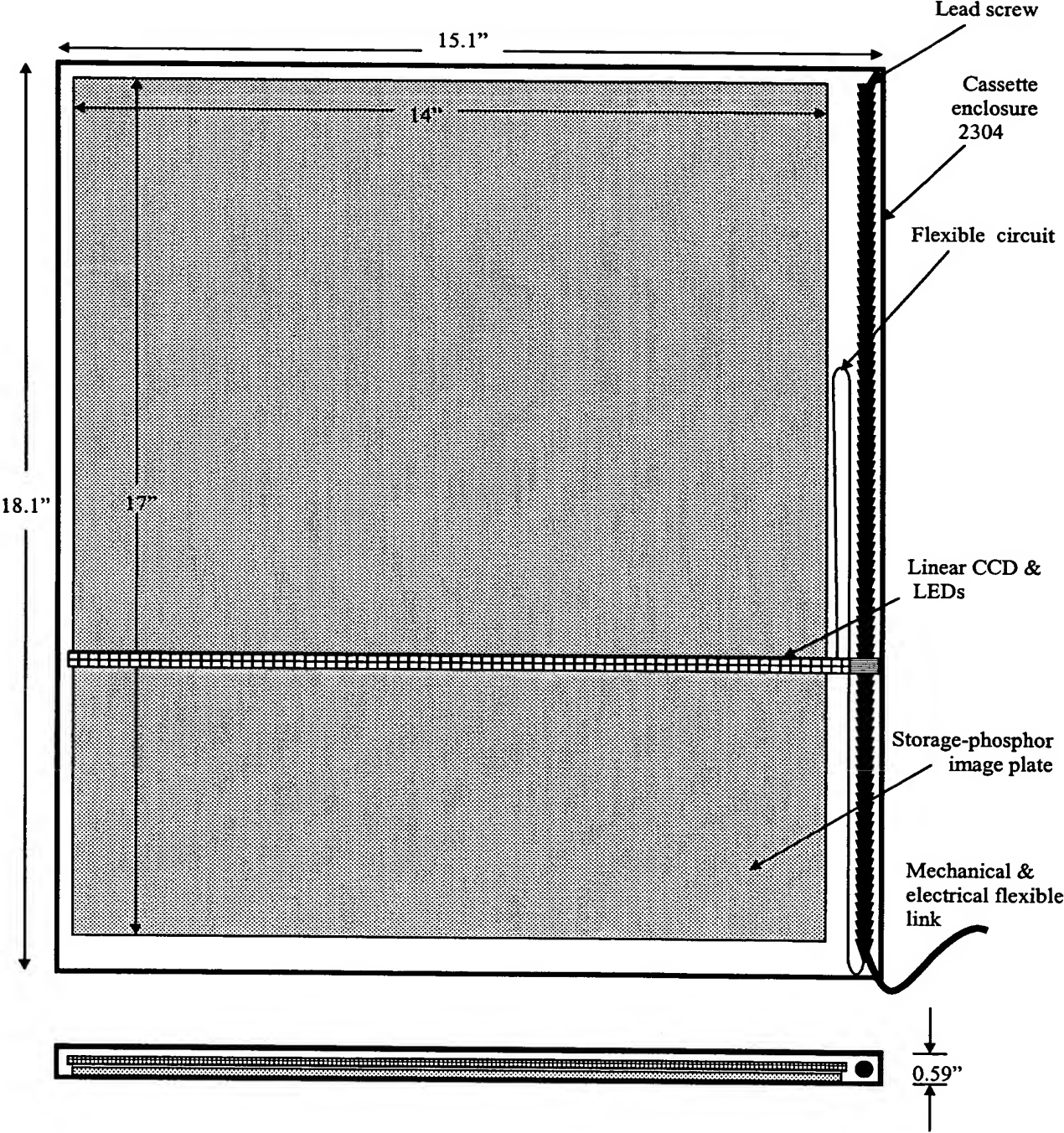
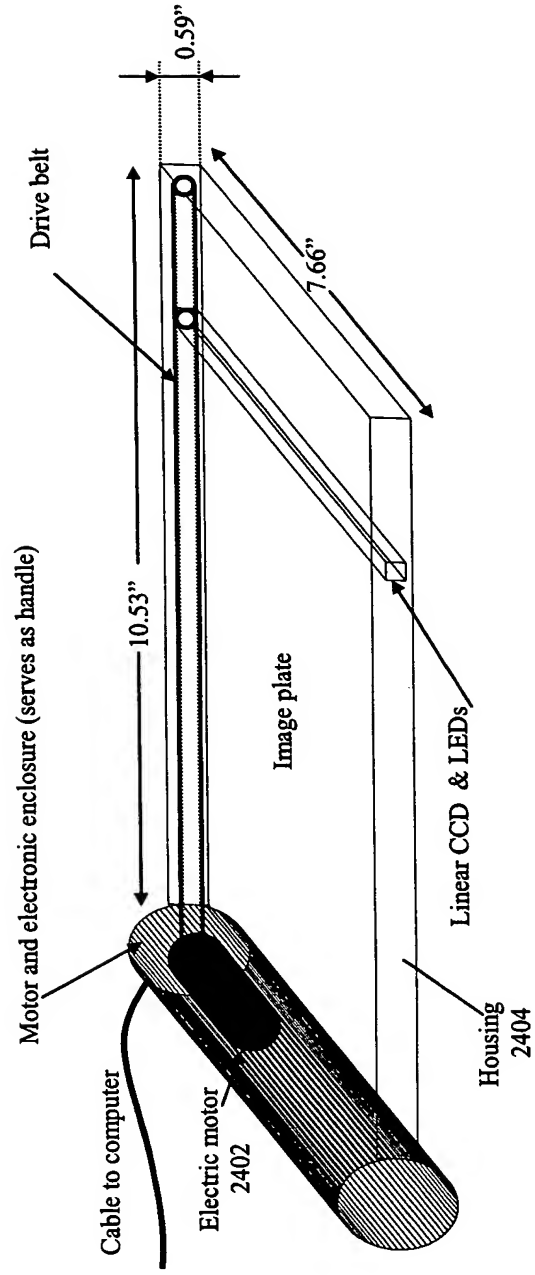


Fig. 24



Mammography cassette enclosure (fits in standard 18cm x 24 cm bucky)